Proceedings
# of the
Thirty-seventh
Ontario Waste Management Conference

held at

The Prince Hotel
Toronto, Ontario

June 10-13, 1990

Sponsored by the
Ontario Ministry of the Environment

ACSL

Copyright Provisions and Restrictions on Copying:

This Ontario Ministry of the Environment work is protected by Crown copyright (unless otherwise indicated), which is held by the Queen's Printer for Ontario. It may be reproduced for non-commercial purposes if credit is given and Crown copyright is acknowledged.

It may not be reproduced, in all or in part, for any commercial purpose except under a licence from the Queen's Printer for Ontario.

For information on reproducing Government of Ontario works, please contact ServiceOntario Publications at copyright@ontario.ca

WASTE REDUCTION INITIATIVES

by

Adam Ciulini, Supervisor, Waste Reduction
Policy Unit, Waste Management Branch,
Environment Ontario, Toronto

Introduction

Non-hazardous residential, commercial and industrial waste generation in Ontario amounts to approximately 9,000,000 tonnes per year. This is equivalent to about 1 tonne per person per year or 2.75 kilograms per person per day.

In Ontario today most of the resources in the waste management sector, both public and private, are directed to burial of waste in landfill.

A complete waste management system today must involve waste reduction, reuse and recycling components, commonly referred to as the 3Rs, in addition to disposal methods such as landfill and incineration. Although this terminology is widely used there is variation in the meanings. The 3Rs as used by the Ministry are described as follows:

- **Reduction** refers to actions which lessen the amount of waste a generator eventually needs managed.

- **Reuse** identifies actions which are based on using something over again in its original form, for the same purpose or some new purpose, until such time as it becomes waste and needs management.

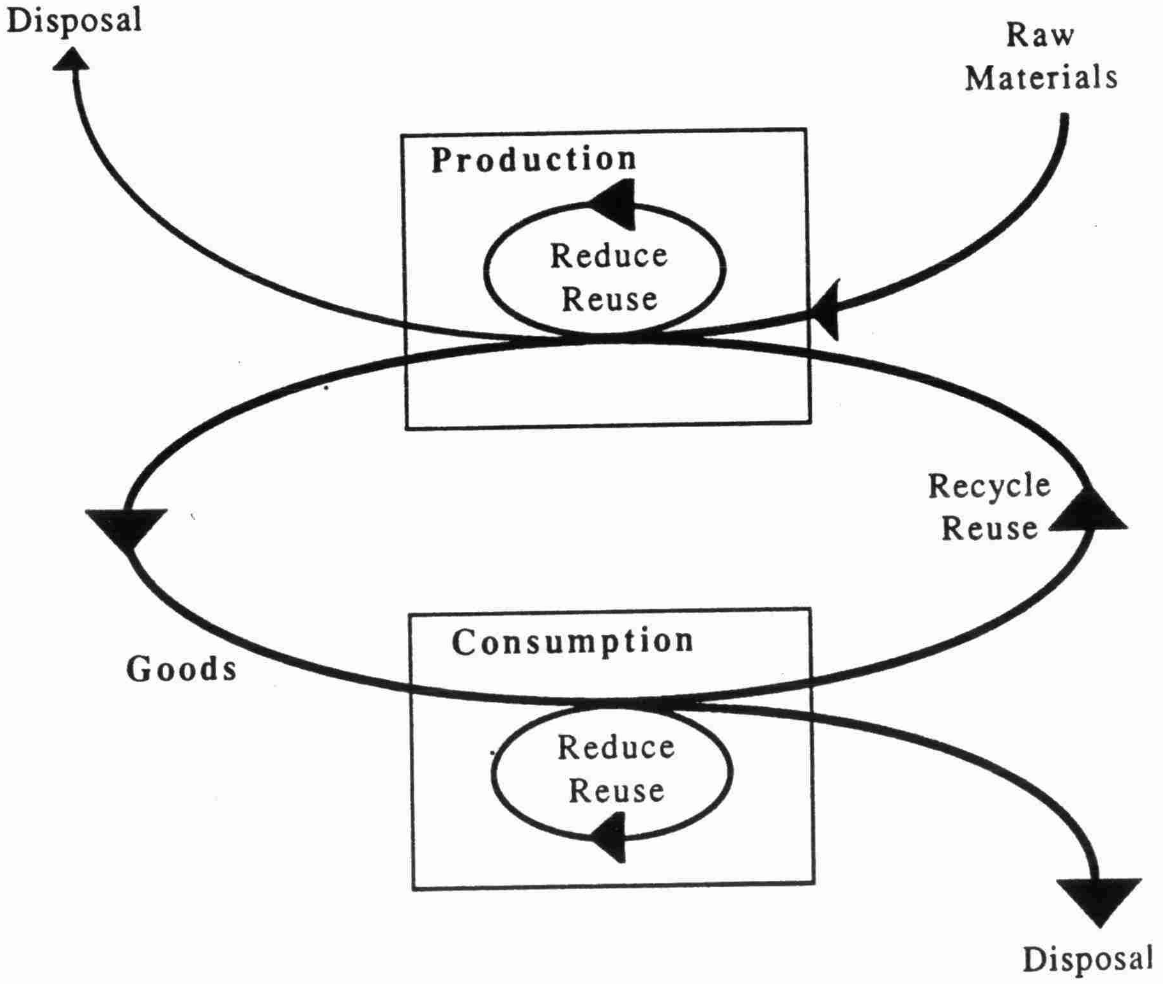
Reduction and reuse, by these definitions, occur before something becomes waste. Two basic options remain once a waste is eventually generated: recycling and disposal.

- **Recycling** represents actions which manage waste in a manner that results in using the materials which constitute the waste as feedstock for some product or application distinct from disposal. This occurs through segregation of waste at source or by extracting materials from waste through various means.

Society operates within a complex system of production and consumption which involves many different sectors. These sectors include industries which make basic raw materials, manufacturers who build the products, commercial services, retailers and distributors. Consumers include the general public, industries, businesses and institutions all of whom produce waste. A complete framework for waste management therefore involves all of these sectors.

When viewed from this perspective the scope for 3Rs shows great potential because all of the sectors can practice the 3Rs. Figure 1. depicts a simplified representation of this view of waste management and the 3Rs as part of the production/consumption cycle.

Figure 1. The Production/Consumption Cycle



3Rs Development in Ontario

The Ministry of the Environment has been involved in the 3Rs as early as the mid-1970's, however, the first full scale use of the Blue Box system as a recycling method in 1983 in Kitchener, Ontario may be the most recent event which has had an impact on shaping the 3Rs in Ontario today. The Blue Box has become the most prevalent symbol of recycling in Ontario today although that wasn't obvious in

1983. Many events since then have advanced the 3Rs in Ontario. A brief summary of these events is useful.

New beverage container regulations were promulgated in 1985. As a result of these regulations the Recycling Advisory Committee was formed to advise the Minister of the Environment on matters related to beverage containers and on means of expanding recycling in the province.

In 1986 Ontario Multi-Material Recycling Inc., the original OMMRI, was formed by members of the soft drink industry and its material suppliers. This was a new example in Ontario of co-operative government/industry action to address waste management issues.

In 1987 the Ministry of the Environment announced a major expansion of its programs to support municipalities and industry. The six-year old program supporting recycling in municipalities, was joined by others aimed at supporting all 3Rs in municipalities and more importantly, a program was added to help the private sector implement 3Rs projects.

In 1988, the number of households served by a Blue Box system broke through the 1,000,000 mark. People in Ontario were becoming very familiar with this recycling method.

In 1989, the Ministry announced that by the year 2000, Ontario should divert 50 percent of its waste from landfill and incineration and into beneficial uses through the 3Rs. A commitment was made to provide significant resources to the achievement of these objectives.

In February 1990, the scope of the government/industry model based on OMMRI was broadened. The Minister of the Environment signed a Memorandum of Understanding with a new organization, OMMRI II, to support an expanded 3Rs program. The soft drink industry joined with the newspaper publishing sector, the packaging industry, the plastics industry, as well as grocery products manufacturers and distributors to create OMMRI II.

In March 1990, the Canadian Council of Ministers of the Environment endorsed the National Packaging Protocol. This is a significant co-ordinated Canada-wide development to address the specific issue of packaging in waste and what to do about it.

In May 1990, the Minister of Government Services announced new procurement policies in support of overall 3Rs objectives. This announcement is part of that Ministry's significant activities to implement 3Rs systems in the provincial government.

Just recently, the continued implementation of municipal Blue Box recycling systems broke the 2,000,000 household mark.

These are all significant events directly related to the 3RS. Others have happened which contribute to 3Rs development including all the waste management master plans underway across the province, significant private and public discussion of the "green" consumer and last but not least extreme difficulty in siting disposal sites anywhere in Ontario.

Getting to 50 percent

Experience to date shows that many of the components needed to achieve the 50 percent diversion goal are known. Many examples of these components are being practiced today in Ontario. The challenge is to build these components into a comprehensive whole and to make them widespread over the next decade. An examination of several of these components illustrates this potential.

Household Waste The most common example of a 3Rs component is residential Blue Box recycling. A typical recycling household can recycle a significant percentage of the materials available which would otherwise become waste. The most common Blue Box materials(newspaper, glass bottles, steel cans, aluminum cans and plastic bottles) represent approximately 21 percent of of a household's waste or 210 kg. per household year. A household using the Blue Box recycles 131.5 kg. per year or over 60 percent of the materials available. This represents over **13 percent** of the household's residential waste. Table 1. summarizes this.

Table 1. Impact of Blue Box Recycling in A Household

Material	Average Percent of waste	Kilograms Available per year	Kilograms Recycled per year	Percent Recycled	Percent of total waste
Newspapers	10	100	100	100	10
Glass bottles	5	50	20	40	2
Steel cans	5	50	10	25	1
Aluminum cans	0.5	5	1	25	0.1
Plastic bottles	0.5	5	0.5	10	0.05
Total	21.0	210	131.5	62	13.15

Another example is backyard composting as practised in thousands of households in Ontario. The average household produces 220 kg. of food waste annually. By using a backyard compost bin and depositing 1 kg. per week the household would reduce its food waste by about 24 percent and its total waste by **5 percent.**

The average household also produces over 150 kg. of yard wastes annually. By mulching this material(lawn clippings) rather than discarding them the household will reduce its total waste by up to **15 percent.**

The diversion capability for a household using these methods alone amounts to **33 percent** of its total waste.

Commercial Waste Based on recent research done by the Ministry of Government Services, offices generate approximately 1 kg. per worker per day. About 60 percent of this was found to be paper. Some offices in the province's paper recycling program are recycling 70 percent of this material or **42 percent** of their total waste.

A Comprehensive Municipal Plan Blue Box, composting, office paper recycling and other components, combine to form the total 3Rs system for a municipality. One example of this can be seen in Metro Toronto's 3Rs plans as reported in the January 1990 issue of SWEAP News. Metro projects that **25 percent** of its waste will be diverted from landfill by 1992. Table 2. summarizes the 3Rs components included in Metro's plan.

Table 2. Metro Toronto Waste Reduction and Recycling Plans-1992

Component	Estimated Material Diverted(Tonnes)
Public Sector Initiatives	
Blue Box - single family	80,000
Blue Box - apartment	30,000
Blue Box - Schools/parks	5,000
Large appliances	5,000
Small commercial establishments	10,000
Leaf composting	60,000
Brush&grass clippings	20,000
Backyard composters	10,000
Pilot wet collection	5,000
Sewage sludge ash	34,000
Public education	16,000
Charge on Municipal agencies	5,000
Demolition& construction	12,000
Private Sector Initiatives	
Disposal fee increase	25,000
Corrugated cardboard	53,000
Tires	9,000
Wood waste	35,000
Drywall	21,000
Office Paper recovery	14,000
Waste audits for industry	30,000
Industrial organic waste	120,000
Public education	8,000
Total	607,000
Percent of Metro's waste	25

This type of plan is illustrative of the type of planning and implementation effort now underway across Ontario by many municipalities in pursuit of 3Rs goals.

Industrial Waste Industrial waste quantity and composition is entirely dependant on the particular industrial sector, and therefore 3Rs potential is going to be dependant on the sector. There are numerous examples of industrial potential. One example is a full service lithographic printer of publications, directories and books. The company spends about $2,000,000 a year on printing inks.

About 9,000 gallons of waste ink is generated every year. All of this waste, which is hazardous, previously went to a hazardous waste disposal facility. A recycling process was installed which resulted in a **95 percent** recycling rate for the waste ink. In addition, this same company was able to recycle **30 percent** of its corrugated cardboard to further reduce its waste flow.

The above examples of household, commercial and industrial 3Rs components clearly show that the parts needed to achieve the 50 percent diversion goal are known and being practiced today. The challenge is to build these components into a comprehensive whole and to make them widespread over the next decade.

Government 3Rs Initiatives

The Ministry of the Environment has a significant number of policy and program initiatives in place and under development which are all aimed at assisting the further expansion of 3Rs in Ontario and the achievement of the diversion goal.

National Packaging Protocol Ontario is participating with the Federal government, other provinces, the Federation of Canadian Municipalities, the Consumers Association of Canada, environmental groups and industry representatives in a federal task force set up by the Canadian Council of Ministers of the Environment to implement the National Packaging Protocol(NAPP). NAPP addresses how best to deal with the waste created by discarded packaging.

NAPP consists of six policies, 3Rs targets to be achieved and related actions which are summarized below.

Policy #1. All packaging shall have minimal effects on the environment.

- Federal government to develop methodologies and guidelines for conducting environmental profiles of packaging including information allowing users to compare choices.

- Industry to undertake environmental profiles of their packaging in accordance with federal guidelines.

- Industry to prepare action plans and schedules to minimize environmental impacts and manage packaging through source reduction, reuse and recycling.

- Multi-stakeholder group to be established to identify research and development needs and new business opportunities

- Government and industry work together to demonstrate new technologies for minimizing environmental impacts.

Policy #2. Priority will be given to the management of packaging through source reduction, reuse and recycling.

- The Federal Government, in consultation with a multi-stakeholder group will establish a code of "Preferred Canadian Packaging Practices" to guide industry in the design of products and the selection and design of packaging. In development of the code consideration shall be given to the following hierarchy:

1) No packaging
2) Minimal packaging
3) Reusable packaging
4) Recyclable packaging and packaging containing recycled materials

- National minimum content standards will be developed by the Federal government for inclusion of secondary/post-consumer material in packaging.

- Infrastructure for reuse and recycling systems to be chosen and developed by Provincial and municiapl governments together with industry.

- Markets for secondary materials will be expanded through industry/government partnerships.

Policy #3. A continuing campaign of information and education will be undertaken to make all Canadians aware of the environmental impacts of packaging.

- Provincial governments will develop,with a multi-stakeholder group, education programs for use in schools .

- A national program will be undertaken to inform all Canadians of the functions and environmental impacts of packaging and to encourage environmentally sound purchasing practices. This program will be developed by a multi-stakeholder group.

Policy #4. These policies will apply to all packaging used in Canada, including imports.

- The federal, provincial and municipal governments will, with sensitivity to the needs of local industries, establish standards and regulations to apply these policies to packaging used in Canada, including imports.

- Federal government will act as liaison with other countries to promote the policies in relation to international trade.

Policy #5. Regulations will be implemented as necessary to achieve compliance with these policies.

- Federal and provincial governments will, with the participation of a multi-stakeholder group, enact regulations which are compatible across Canada, specifying performance requirements, targets, and deadlines for achievement consistent with this policy.

Policy #6. All government policies and practices affecting packaging will be consistent with these policies.

- Government policies and practices which impede achievement of the objectives of these policies will be identified and where possible removed or modified.

- Government policies and practices such as procurement, will be developed and implemented to support the achievement of these objectives.

Targets for the 3Rs have been established by the NAPP as follows:

- By December 31, 1990 all provinces must have in place a nationally co-ordinated data collection program to make possible the monitoring of the following targets .

- By December 31, 1992 packaging sent for disposal shall be no more than 80% of the amount sent in 1988.

- By December 31, 1996 packaging sent for disposal shall be no more than 65% of the amount sent in 1988.

- By December 31, 2000 packaging sent for disposal shall be no more than 50% of the amount sent in 1988.

- 50% of these diversions shall be achieved through new source reduction and new reuse initiatives. Recycling programs shall make up the remainder of these diversions.

Government/Industry Initiatives The Ministry is developing a mechanism to ensure that the industries that are in sectors similar to the member companies of OMMRI II will participate in achieving 3Rs objectives.

Preliminary assessments are being made to establish other potential industry sectors(OMMRI III, IV etc.) with which the government can participate using the OMMRI model.

Approvals Requirements The approvals requirements for facilities which involve recycling systems are under review to determine ways and means of streamlining the process, providing a consistent approach to applicants, and encouraging recycling while maintaining necessary environmental controls.

Municipal 3Rs Programs The Ministry continues to provide financial and technical support to municipalities and others to implement 3Rs projects for municipal waste. A series of programs are available:

- The **Municipal Recycling Support Program** provides capital grants of up to one-third and operating cost grants up to 50 percent for residential recycling using the Blue Box, depots and other source separation approaches. The grants are provided in conjunction with OMMRI and have resulted in a system diverting over 250,000 tonnes of recyclable materials per year.

- The **Municipal Reduction/Reuse Program** encourages reduction of waste from households. This includes an extremely successful home composting program where the Ministry provides up to 50 percent of the costs of the backyard bins purchased by a municipality . Grants for over 120,000 bins have already been committed to date. Projects considering another 80,000 bins are under development bringing the total to 200,000 bins to date.

- The **Municipal Waste Recovery Program** supports recycling through capital grants for systems such as the "wet/dry" system which is being supported by the Ministry in major projects in Guelph and elsewhere.

Table 3. summarizes the municipal programs available and the associated expenditures in fiscal 1989 close to $18,000,000. The program budget has been increased in fiscal 1990 to $ 25,100,000.

Table 3. Municipal 3Rs Grants Summary - Fiscal 1989

Program Name	# Projects	Total Spent ($)
Municipal Recycling Support	209	15,428,000
Municipal Waste Recovery	14	1,284,000
Municipal Reduction/Reuse	41	1,071,000
Total	264	17,783,000

Certain aspects of the funding program have been enhanced. For example, the eligibility period for capital funding under the Municipal Recycling Support Program has been removed. Also, Blue Box bin grants are now available to communities implementing depot systems where there is no curbside collection.

A pro-active approach to encouraging 3Rs and providing assistance where needed to municipal governments is part of the program delivery. A close working relationship between the Ministry's regional offices and the Waste Management Branch enhances the support system to deal more effectively with local needs and development plans.

Information sharing is essential in a growth area such as 3Rs and the Ministry is jointly developing a database with OMMRI and the Recycling Council of Ontario to capture data and provide useful information to municipalities and others.

Student Action For Recycling Program This program is greatly expanding the implementation of recycling in Ontario schools. Approximately 900 schools in 18 boards are now involved under the program. Grants are provided to school boards and municipalities for planning and capital costs for equipment needed. In fiscal 1990 a budget of $3,200,000 has been allocated.

Household Hazardous Waste Program This program is very successful in assisting municipalities to divert or safely dispose household products which may be hazardous. The program provides up to $15,000 in grants including an incentive to encourage recycling rather than disposal for waste paints and crankcase oils which make up the vast majority of materials handled by these projects. Almost $1,000,000 has been provided in grants to date. Table 4. Summarizes the program to date.

Table 4. Household Hazardous Waste Program Expenditures To Date

Fiscal Year	#Projects	Grants($)
1986	9	77,900
1987	19	171,300
1988	36	324,700
1989	64	393,700
Total To Date	128	967,600

Industrial 3Rs The industrial/commercial waste in Ontario is estimated to be 5,000,000 tonnes per year representing more than 50 percent of the solid non-hazardous waste produced annually. Most of this waste is generally handled by companies themselves and not by municipal government. The Ministry assists the private sector through several initiatives designed specifically to address the needs of industry.

- The **Industrial Waste Diversion Program** provides technical and financial assistance to industry for projects designed to divert industrial waste from disposal through the 3Rs. Industrial and commercial companies as well as institutions are eligible for capital grants which provide up to 50 percent of the costs of the project.

- The diverse and technical complexity associated with industrial waste requires research and development in many cases to design a process or system to use the 3Rs effectively. The Industrial Waste Diversion Program provides grants up to 100 percent of the cost of this type of project.

It is a significant indication of the future 3Rs potential in Ontario industry that although the Industrial Waste Diversion Program was initiated in 1987 the 125 capital projects approved to date represent a combined diversion of 730,000 tonnes of solid waste and 15,600,000 litres of liquid waste annually. This is equivalent to a 15 percent diversion rate. Over 400 proposals have been received to date illustrating the significant interest and potential for industrial waste 3RS.

In a related area, the Ministry of the Environment will invest $16,000,000 in fiscal 1990 on a waste tire recycling program which includes:

- support for collection,handling and sorting used tires.
- developing and implementing technologies.

- market development research for tire derived products.
- underwriting use of rubber in asphalt applications

Market Development The recycling component of the 3Rs will represent millions of tonnes annually of waste materials requiring an end use. The Ministry of the Environment and others are working to ensure these markets are there. Several initiatives will assist in this regard.

Assistance under the Industrial Waste Diversion Program is provided to companies which provide markets for recyclable materials. For example, the Superwood recycling facility in Mississauga inaugurated in May 1990 was made possible partly through support provided from the Ministry. The Atlantic Packaging deinking plant in Whitby will also receive Ministry support. The capacity of this plant, when combined with other existing markets, is expected to provide long term secure markets for Ontario's Blue Box newspaper supply. These types of ventures are essential if waste material are to be effectively recycled.

Co-operative efforts between the Ministry, companies and municipalities are a common approach taken to develop successful ventures. For example, the establishment of a successful telephone book recycling system in several municipalities and a film plastic demonstration project in Peterborough resulted from co-operative efforts of this type.

Technology Development The Ministry has initiated a number of technically oriented projects to satisfy information or policy development needs in Ontario.

The uncertainties with respect to the performance of degradable plastics, combined with the significant public and private debate about degradables and their role in addressing the waste management problem, suggested that a study was needed. A study of degradable plastics was conducted jointly with the Society of the Plastics Industry to help determine current facts about these materials. The study found that standards, definitions and other data are lacking and must be developed before effective policies can be put in place.

Composting is a significant component of the future 3Rs efforts in Ontario. Efforts are under way to develop guidelines and standards for large scale compost production, quality control, end use applications and facility siting. A study of the compost technical literature has been undertaken as a preliminary step to development of these guidelines.

The composition and quantity of waste are important facts to know when pursuing 3Rs approaches. It is more difficult, time consuming and risky to design an effective 3Rs method without knowing what is in the waste and how much. The Ministry has commissioned a study to develop a system to determine these parameters for Ontario's residential, commercial and light industrial wastes. Municipalities and others will be able to use this methodology in future for their own planning purposes. Results from the study process will also be useful to update information about Ontario's waste stream.

Communications The Ministry provides a number of general and program related information materials to a wide audience including young people, municipal officials, institutions and industry. In addition, ongoing contact is maintained with all client groups through seminars and meetings.

Some examples of the communications program include:

- "Hazardous Wastes in Your Home" - household products, their waste management and safe alternatives.
- "The Earth Times" - A humorous pamphlet about the 3Rs
- "Be a Garbage Transformer" - A pamphlet aimed at children
- "A Guide to Establishing a School Recycling Project"
- Information packages on all grant programs

Communications materials are constantly under development and many more are expected in the future.

Other Initiatives

Ministry of Government Services Program The Ministry of Government Services initiated a Waste Management Program in October 1989 which includes major 3Rs initiatives applying to the more than 80,000 government employees across provincial government ministries and agencies.

At the present time all government-owned buildings in Metropolitan Toronto have a full recycling program including fine paper, newspaper,cans, bottles and corrugated cardboard. Buildings leased by the government are also being included as negotiations are concluded with each landlord.

Government-owned and leased buildings outside of Metropolitan Toronto are now being included in this program with a goal of providing recycling services to 70 % of civil servants in 1990.

The Ministry has also undertaken a purchasing program to ensure the highest content of post-consumer recycled material in the paper products it purchases. The Ministry is now offering some 70 environmentally sensitive products such as recycled photocopy paper, envelopes and a reuse system for laser printer cartridges.

The government computer group is investigating a variety of new techniques designed to reduce the paper usage within the government. The initiatives range from computerized ordering to computerizing intergovernment and municipal phone books.

In May 1990, the Ministry announced a significant new development. It has implemented new procurement policies which are designed to contribute to the 3Rs goals of Ontario. The measures included in this policy are:

- mandatory standards for designated products which contain specified levels of recycled content from post-consumer waste.
- elimination of over-specification and unnecessary restrictions on goods and services that hinder the implementation of the policy.
- use of product specifications that are consistent with the national guidelines on minimum recycled content issued by Environment Canada.
- designation of goods and services which further the 3Rs.
- listing goods and services that lend themselves to the application of environmental considerations.
- listing suppliers who provide designated goods and services.
- establish and maintain minimum acceptable specifications for designated goods and services in conjunction with other jurisdictions.

- establish and maintain collective agreements for designated goods and services that must be used by all ministries.

Environmental Technologies Program In March 1990, the Ministry of the Environment announced the Environmental Technologies Program. The program will fund up to 50 percent of projects proposed by Canadian companies, universities, research organizations, municipalities, conservation authorities or public interest groups, to a maximum of $500,000 per year for up to three years.

The money is to be used for research, development and testing of products or processes and for full scale field trials and technical demonstrations.

In addition to air pollution, spills cleanup and other environmental areas, products or processes which include technology to reduce, reuse or recycle municipal, industrial or commercial waste are eligible.

Summary

Non-hazardous solid waste generation in Ontario amounts to approximately 9,000,000 tonnes per year. Waste reduction, reuse and recycling are recognized as the alternatives to pursue to divert waste from disposal.

All sectors in society can and must practice the 3Rs.

Beginning with the Blue Box, many initiatives have advanced the 3Rs in Ontario. These include beverage container regulations, OMMRI support, expanded Ministry support programs, setting a 50 percent diversion goal, OMMRI II formation, a National Packaging Policy and new procurement policies.

Many of the components for reaching the 50 percent goal are now available for implementation. Municipalities provide recycling services for 2,000,000 households using the Blue Box system and help residents reduce their waste through provision of over 100,000 backyard composting bins. Industries are implementing 3Rs projects which will divert 15 percent of industrial waste.

The government has a wide range of initiatives underway to support 3Rs development in Ontario. These include policies to support 3Rs through procurement, grant programs to help municipalities and industry and 3Rs practices within the government.

Ontario is moving steadily to a point where waste management will revolve around waste diversion in a sustainable way rather than remaining preoccupied with disposal.

(8551)
TD/897/O68